CLAIMS

What is claimed is:

1. A confocal imaging system for imaging a specimen comprising:

a light source;

a light deflector capable of positioning a beam of light produced by the light source at one of a series of predetermined points on the specimen;

an addressable spatial filter capable of selectively filtering light from the specimen; and

a central processing unit capable of providing selective position control to the light deflector and the addressable spatial filter.

2. The confocal imaging system according to claim 1, wherein the addressable spatial filter is a complementary metal oxide semiconductor camera.

3. The confocal imaging system according to claim 1, wherein the addressable spatial filter is digital micromirror device.

4. The confocal imaging system according to claim 1, wherein the high-speed light deflector is an acousto-optic deflector.

5. The confocal imaging system according to claim 1, wherein the high-speed light deflector is a digital micromirror device.

6. The confocal imaging system according to claim 1, wherein the specimen fluoresces, reflects, or transmits light that is received by the addressable spatial filter in response to the light beam from the light source being positioned on the specimen.

7. The confocal imaging system according to claim 6, wherein a user can select at least one site-of-interest on the image of the specimen.

8. The confocal imaging system according to claim 7, wherein the central processing unit controls the high-speed light deflector to position the light beam onto the at least one site-of-interest selected by the user.

9. The confocal imaging system according to claim 8, wherein:

the central processing unit spatially and temporally synchronizes the high-speed light deflector and the addressable spatial filter so that the light beam from the light source is directed to the at least one site-of-interest;

light that is fluoresced, reflected, or transmitted from the at least one site-of-interest is permitted to pass through the addressable spatial filter; and

light that is fluoresced, reflected, or transmitted from a site that is not of interest is filtered out by the addressable spatial filter.

10. The confocal imaging system according to claim 9, wherein the central processing unit scans the at least one site-of-interest at a frame rate greater than or equal to 500 Hz.

11. The confocal imaging system according to claim 9, wherein the central processing unit scans the at least one site-of-interest at a frame rate greater than or equal to 1 kHz.

12. The confocal imaging system according to claim 9, wherein the central processing unit scans the at least one site-of-interest at a frame rate greater than or equal to (25,000 / n) Hz, where "n" is equal to the number of sites-of-interest.

13. An object comprising an optical recording produced by the system according to claim 1.

14. The confocal imaging system according to claim 1, wherein the system is capable of collecting a full frame confocal image of the specimen.

15. A method of acquiring a multi-site optical recording, comprising the following steps:

a) selecting at least one site-of-interest on an object;

b) configuring a high-speed light deflector to illuminate the at least one site-of-interest;

c) configuring an addressable spatial filter to record the light that is fluoresced, reflected, or transmitted by the at least one site-of-interest; and

d) recording the light that is fluoresced, reflected, or transmitted by the at least one site-of-interest.

16. The method according to claim 15, wherein the selection and illumination of a plurality of sites-of-interest is performed sequentially.

17. The method according to claim 15, wherein the steps are performed at a frequency greater than or equal to 500 Hz.

18. The method according to claim 15, wherein the steps are performed at a frequency greater than or equal to 1 kHz.

19. The method according to claim 15, wherein the steps are performed at a frequency greater than or equal to (25,000 / n) Hz, where "n" is equal to the number of sites-of-interest.

20. An object comprising an optical recording produced by the method according to claim 15.